

Exhibit 10 to Supplement to Expert Opinions of Dr. Marwa Zaatari

Supplement to Expert Opinions of Dr. Marwa Zaatari

Surface Testing Data Summary:

Testing reduction of SARS-COV-2 on surfaces was critical throughout 2020 and until 30 April 2021. “Throughout much of 2020, the World Health Organization (WHO) held tight to the idea that SARS-CoV-2, the virus that causes COVID-19, spreads through relatively large ‘respiratory’ droplets that are expelled by infected people while coughing, sneezing, or speaking. These droplets contaminate nearby surfaces or get breathed in, so the WHO stressed the importance of washing hands and disinfecting surfaces. It took many months for the agency to acknowledge that the virus could travel on tiny particles called aerosols that can spread widely and linger in the air. And nearly two years passed before the WHO clearly stated that the virus is airborne.”¹ On December 2021, “nearly two years into the pandemic, the WHO uses the term ‘airborne’ for the first time.”¹ The Centers for Disease Control and Prevention (CDC) followed a parallel path: “first, stating the importance of droplet transmission; then, in September 2020, briefly posting on its website an acceptance of airborne transmission that was taken down three days later; and finally, on May 7, 2021, acknowledging that aerosol inhalation is important for transmission.”²

GPS commissioned numerous lab tests to test the reduction of viruses on surfaces. GPS marketed “rate of reduction” of organisms and pathogens, such as SARS-COV-2, the virus that causes Covid-19, to demonstrate that their technology is effective at “killing” the virus.

I have compiled data from surface tests commissioned by GPS using third-party laboratory and independent tests performed in 2020 and 2021 and summarized the results below. I have summarized the device model, information about ozone generation, concentration of ions measured during the test, GPS reduction marketing claims, reduction attributed to the GPS device as reported by the lab and as calculated using the methodology explained below, and whether GPS device is effective by comparing the results to 1) the environmental protection agency (EPA) recommendations and 2) the results obtained by two independent studies, referred to in this report as the Boeing Study and the Trane study.

I was only able to fully analyze the data after I received documents from GPS15 (produced on August 17, 2022). [REDACTED]

[REDACTED] calculate “net loss in relation to control”, i.e., what is the reduction percentage for the device itself by subtracting reduction percentage for the control (experiment run in the same conditions without the ion generator off).

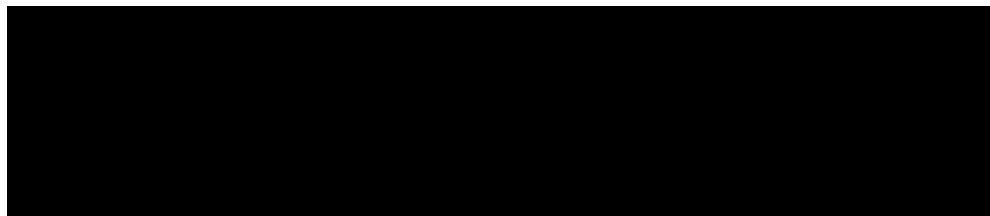
¹ <https://www.nature.com/articles/d41586-022-00925-7>

² <https://onlinelibrary.wiley.com/doi/10.1111/ina.13070>

Net loss in relation to control is calculated using the following equations:

- GPS Device on reduction % = (concentration_{ionizer on} at time i – initial concentration)/ initial concentration
- Control (GPS device off) reduction % = (concentration_{ionizer off} at time i – initial concentration)/ initial concentration
- Net loss in relation to control at time i = GPS Device on reduction % - Control (GPS device off) reduction %

For example: [REDACTED]



The data presented in the tables below demonstrates that the GPS device is not effective because 1) it did not meet the EPA recommendation for efficacy claims published by the EPA, further described by Dr. Edward Sobek (GPS CSO) (GPS07_00026017-19) [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] and 2) independent tests showed that the device was ineffective for the removal of MS2 on surfaces (the Trane study) and poor results for the removal of various organisms (including “no reduction” at the test performed in Huntsville lab) (the Boeing study).

Dr. Marwa Zaatari Supplemental Report – November 4, 2022

Date	Independent test?	Lab ¹	Model	Ozone generator? ²	Organism	Ion Levels (ions/cm ³)	GPS Reported Reduction %	Reduction based on lab results % ⁴	Time (mins)	Log reduction	Meets efficacy for 3 log reduction (99.9%)? ⁶	EPA claim log
Apr-20	no	ALG	iWave-R	yes	Human Coronavirus 229 E	1,500 60 mins	99%	90%	60	1.00	no	
								82%	30	0.75	no	
May-20	no	■■■	GPS-DM48-AC	no	Human Coronavirus 229 E	■■■		■■■	■■■	0.25	no	
						■■■		■■■	■■■	-	no	
May-20	no	■■■	GPS-iMOD	no	Human Coronavirus 229 E	■■■		■■■	■■■	0.25	no	
						■■■		■■■	■■■	-	no	
Jun-20	no	IBA	ACA-RN-0001, ACA4800GU-1	yes	SARS-COV2	27,000	99.4%	39% ⁵	30	0.21	no	
Aug-20	no	IBA	ACA-RN-0001, ACA4800GU-1	yes	SARS-COV2 on leather ¹⁰	>26,000	99.8%	39%	30	0.20	no	
Jan-21	no	■■■	ACA-RN-0001, ACA4800GU-1	yes	■■■■■	■■■		■■■	■■■	0.58	no	
Jan-21	no	■■■	ACA-RN-0001, ACA4800GU-1	yes	■■■■■	■■■		■■■	■■■	0.01	no	
Mar-21	no	IBA	GPS-FC48-AC	no	SARS-COV2	9,700	62.85%	42%	60	0.23	no	
						23,600	99.97%	63%	60	0.44	no	
Mar-21	no	IBA	GPS-iMOD	no	SARS-COV2	10,250	70.71%	44%	60	0.25	no	
						20,600	99.98%	63%	60	0.43	no	
Jun-21	no	IBA	GPS-FC48-AC	no	■■■	■■■		■■■	■■■	0.47	no	
Jun-21	no	IBA	GPS-FC48-AC	no	■■■	■■■		■■■	■■■	0.50	no	
Jun-21	no	IBA	GPS-FC48-AC	no	■■■	■■■		■■■	■■■	0.62	no	
								■■■	■■■	0.04	no	
Jun-21	no	■■■	GPS-FC48-AC	no	■■■■■	■■■■■		■■■	60	0.07	no	
								■■■		0.08	no	
								■■■		0.09	no	
								■■■		0.05	no	
April-21	Yes, Boeing ⁸	Huntsville Lab ⁹	DM-48		Pseudomonas	40,000 to 75,000		<20.6%	60	<0.1	no	
					Staph			<20.6%	60	<0.1	no	
					MS2			<20.6%	60	<0.1	no	
					Faecalis			<20.6%	60	<0.1	no	
					Cloacae			<20.6%	60	<0.1	no	
					E. Coli			<20.6%	30-90	<0.1	no	
		U of Arizona	DM-48 (GPS03_00004 489 GPS03_000044 91)		MS2, without soil	■■■		■■■	60	0.03	no	
								■■■	120	-	no	
					MS2, with soil	■■■		■■■	60	0.35	no	
								■■■	120	-	no	
					E. Coli	■■■		■■■	60	0.20	no	
					Human Coronavirus 229 E	■■■		■■■	30	0.05	no	
								■■■	60	0.20	no	
								■■■	15	-	no	
					Human Coronavirus 229 E	>50,000 ions/cm ³ (positive ions were attenuated)		■■■	30	-	no	
								66.8%	60	0.48	no	
Jan-21	Yes, Trane	LMS	NPBI		MS2	6,000		"ineffective against MS2 surface"			no	

¹ 04-20, ALG lab Test: GPS04_0005805-5914 specifically pages GPS04_00005864-5870, Marketing: GPS07_00116789-796, carrier was 1" away from the ionizer

05-20, [REDACTED]

01-21, Trane Study LMS lab GPS04_00021207-1269, chamber size 1007 ft3

² Dr. Sauer-Budge Initial Report pages 20 to 25 and GPS07_00034028 GPS07_00034038, GPS03_00002133 GPS03_00002136, GPS05_00000873 GPS05_00000882, GPS15_00003466 GPS15_00003466, GPS07_00097586 GPS07_00097586, GPS07_00026524 GPS07_00026524, GPS15_00116910 GPS15_00116911, GPS15_00116918 GPS15_00116919, GPS15_00116916 GPS15_00116917, GPS15_00116905 GPS15_00116906, GPS15_00116901 GPS15_00116902, GPS15_00116895 GPS15_00116896, GPS07_00026523 GPS07_00026523

⁴ Calculated using Innovative Bioanalysis reported data for control (GPS device off) and test (GPS device on) and using Innovative Bioanalysis calculation method presented as "net loss in relation to control at 60 mins" (GPS15_00013340-353).

⁵ The lab test did not include control in the testing. I used the same results from the control of the test done at IBA with SARS-COV-2 on august 2020, see next row.

⁶ EPA efficacy claim for 3 log reductions: <https://www.epa.gov/pesticide-registration/guidance-products-adding-residual-efficacy-claims#:~:text=Products%20should%20achieve%20%E2%89%A5%203,the%20standard%20non%2Dresidual%20disinfectants.>

⁸

Boeing did additional two tests: 1- by National Research Council Canada with their Boeing 737-200 airframe and 2- Boeing Charleston 787-10 ground cart testing.

⁹ From Boeing report:

"There were no reductions in Staphylococcus aureus, Pseudomonas aeruginosa, Enterococcus faecalis, and Enterobacter cloacae with <20.6% or <0.1 log10 reduction over a 60 minute exposure duration"

"The norovirus surrogate MS2 Bacteriophage bared no observable reduction (<20.6% or <0.1-log10) over a 60 minute interval."

"no observable reduction in viability (<20.6% or <0.1 log10) over a 60 minute exposure duration"

¹⁰ Tests on three different surfaces: kydex, aluminum, and leather. Results are presented for leather.

[REDACTED]

- [REDACTED]
- [REDACTED]
[REDACTED]
- [REDACTED]
[REDACTED]
[REDACTED]
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- [REDACTED]er

[REDACTED]

2) June 2020 SARS-COV-2 Testing

[illegible][illegible]

[REDACTED]
 [REDACTED]
 [REDACTED]
 [REDACTED]
 [REDACTED]
 [REDACTED]

- [REDACTED] [REDACTED]
- [REDACTED]

■ [REDACTED]
[REDACTED]

- [REDACTED]
- [REDACTED]
- Conditions of the test are not representative of real-world conditions as described by Mr. Jacob Persky, MPH, CIH after conducting real-world tests and comparing these tests to the claims of GPS (GPS15_00115937 - GPS15_00115939) (report reference: MZ020102 - MZ020104):
 - “taking one small 2” piece of leather that has been sprayed with SARS-COV-2 and blasting it with 27,000 ions/cc to show a 99.99% “overall average decrease in active virus in 30 minutes” does not translate into these devices being meaningfully effective at reducing the risk of airborne virus transmission in a real-world building setting”
 - “When we turned on the units and provided “typical” airflow to the room as one would expect for a classroom setting with a reasonable occupant density, the concentration of ions in the room was about 1,000 to 2,000 ions/cc which is much lower than the 27,000 ions/cc that GPS reported in its testing that underpins the basis of the COVID-killing efficacy claims. Next, we dialed up the airflow.”
 - “To generate and maintain more than 20,000 ions/cc in the air within our test classroom required over 2,200 CFM of airflow (about double what one would expect for a room this size), and more importantly it required conditions like a wind tunnel just like the wind speed in the Innovative Bioanalysis study conducted on GPS units that reported test conditions had average airflow speeds of 2,133 ft/minute (24 mph). I’ve never been in a classroom with 24 mph winds; that’s not a realistic test condition. This is a great example of a point that the EPA makes on its webpage titled “Can air cleaning devices that use bipolar ionization, including portable air cleaners and in-duct air cleaners used in HVAC systems, protect me from COVID-19? when it states, “This is an emerging technology, and little research is available that evaluates it outside of lab conditions.”
- [REDACTED]
- [REDACTED]

B. Analysis for the Boeing Report

[REDACTED]

I also used information provided to me by Mr. Keith Garris, a high-level sales executive at GPS (Mr. Garris was employed with GPS from 2019 till 2022)³. Mr. Keith Garris was involved in the Boeing testing that happened at The University of Arizona by Dr. Charles Gerba.⁴ In addition to Mr. Garris, Mr. Waddell (GPS CTO and founder) was also included in discussions with Boeing and in sending, receiving, and reviewing test protocols.

[REDACTED]

When the results turned out to be very poor, Mr. Keith Garris (GPS) at the instruction of Mr. Charlie Waddell (GPS), attenuated the positive ions of the device to increase the negative ions: “Charlie Waddell instructed me to suppress the positive ion emitter by placing a tape over it. I had 632,000 negative ions running for two hours in a standard 15 foot room with 8 ft ceiling.” “I suppressed the positive ions and just did straight negatives because that was going to provide a better result according to Charlie Waddell”. Suppressing the positive ions results in 0% reduction

³ Doc 375.

⁴ <https://west.arizona.edu/person/charles-gerba>

in 30 mins and 66.7% reduction in 60 mins. Mr. Waddell was right, playing with the device did provide better results. However, 1) the results were still short to be meaningful (less than 90% and less than 3-5 log reduction) and 2) GPS sells their technology as a **bipolar** ionizer (i.e., with both negative and positive ions) and not **unipolar** (i.e., negative ions only), therefore the tests conducted by playing with the device does not represent the device as it is sold, marketed, and within its intended use to schools and other building types. I could not find any marketing materials or manufacturer recommendations from GPS suggesting that the devices should suppress the positive ions.

Boeing tests used a GPS-DM48 model. I compared reduction results as reported by Boeing (independent study) [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]

GPS device is not effective, not according to GPS commissioned tests and not according to independent testing by Boeing. [REDACTED] [REDACTED]

What is astounding is that GPS wrote a response rebuttal to the Boeing report stating the following:

- 1- The testing at the University of Arizona laboratory showed a 66.7% reduction of Coronavirus 229E which they deemed “statistically significant” **even though for some reason unknown to GPS, the lab decided to attenuate (prevent) the production of positive ions, which meant they were operating the GPS unit outside of standard conditions.**

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

As I mentioned in the previous paragraph, none of these three points are factually correct. At the time that GPS made the response to Boeing, GPS knew about the falsity of these statements as shown in their discovery and as stated Mr. Keith Garris. GPS fabricated the information presented in its response to Boeing and response to customers to deflect the negative results shown in those tests.

Reliance Chart

Begin Number	End Number
GPS16_00000027	GPS16_00000028
GPS15_00116918	GPS15_00116919
GPS15_00116916	GPS15_00116917
GPS15_00116910	GPS15_00116911
GPS15_00116905	GPS15_00116906
GPS15_00116901	GPS15_00116902
GPS15_00116895	GPS15_00116896
GPS15_00115937	GPS15_00115939
GPS15_00110440	GPS15_00110462
GPS15_00084151	GPS15_00084152
GPS15_00084148	GPS15_00084150
GPS15_00036435	GPS15_00036436
GPS15_00013340	GPS15_00013353
GPS15_00012053	GPS15_00012054
GPS15_00008765	GPS15_00008771
GPS15_00008010	GPS15_00008012
GPS15_00003466	GPS15_00003466
GPS07_00116789	GPS07_00116797
GPS07_00098865	GPS07_00098872
GPS07_00098863	GPS07_00098864
GPS07_00097586	GPS07_00097586
GPS07_00087470	GPS07_00087477
GPS07_00083846	GPS07_00083853
GPS07_00065478	GPS07_00065558
GPS07_00029426	GPS07_00029439
GPS07_00029412	GPS07_00029425
GPS07_00026523	GPS07_00026523
GPS07_00026017	GPS07_00026019
GPS07_00025862	GPS07_00025866
GPS07_00025751	GPS07_00025754
GPS07_00025305	GPS07_00025318
GPS07_00025298	GPS07_00025304
GPS07_00015064	GPS07_00015075
GPS07_00014429	GPS07_00014432
GPS07_00014426	GPS07_00014428
GPS07_00013084	GPS07_00013094

GPS07_00010155	GPS07_00010156
GPS07_00007675	GPS07_00007677
GPS07_00007642	GPS07_00007644
GPS07_00004371	GPS07_00004372
GPS05_00000873	GPS05_00000882
GPS05_00000096	GPS05_00000104
GPS05_00000037	GPS05_00000045
GPS05_00000006	GPS05_00000016
GPS04_00021209	GPS04_00021269
GPS04_00021207	GPS04_00021208
GPS04_00011356	GPS04_00011357
GPS04_00005807	GPS04_00005914
GPS04_00005268	GPS04_00005272
GPS04_00005094	GPS04_00005098
GPS03_00004489	GPS03_00004491
GPS03_00004485	GPS03_00004488
GPS03_00004455	GPS03_00004456
GPS03_00003676	GPS03_00003688
GPS03_00002133	GPS03_00002136
MZ020102	MZ20104
MZ029841	MZ029841
MZ029842	MZ029842
MZ029843	MZ029843
MZ029845	MZ029932

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[REDACTED]

A. Scenario 1:

Velocity = 2,133 feet per min

Qty = 1

[REDACTED]

[REDACTED]	
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]

B. Scenario 2:

Velocity = 500 feet per min

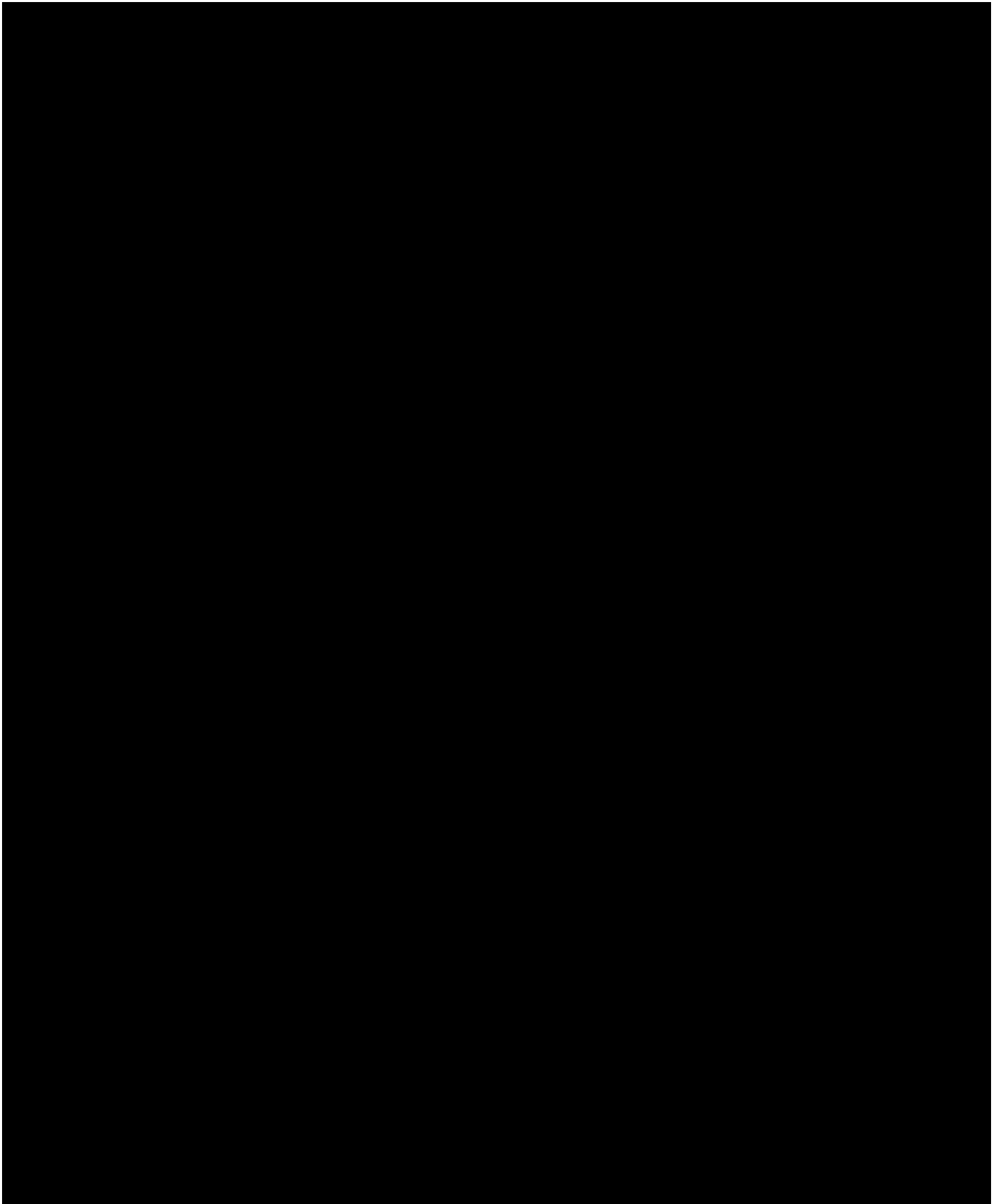
Qty = 1

[REDACTED]



I present below in graphical manner (Figure 1, Figure 2) the ion concentrations in different positions in the classroom. For kids sitting at a distance greater than 7 feet, I estimated the ion concentrations by extrapolating the data by establishing a fit from points 3 feet and beyond. It is expected that the farther the distance from the ionizer, the lower the ion concentration would be. This is consistent with Innovative Bioanalysis findings regarding the ion concentration distribution in a room (GPS07_00029440-51).

[REDACTED]



2) School Bus

I estimated ion distribution inside a school bus following the ion concentrations measured by Innovative Bioanalysis lab for a room 20' x 8'(GPS07_00015064-75). The width of the chamber (8') is comparable to the width of a school bus. In this example, the ionizer is installed in the location shown in Figure 3.

[REDACTED]

[REDACTED]

[REDACTED]

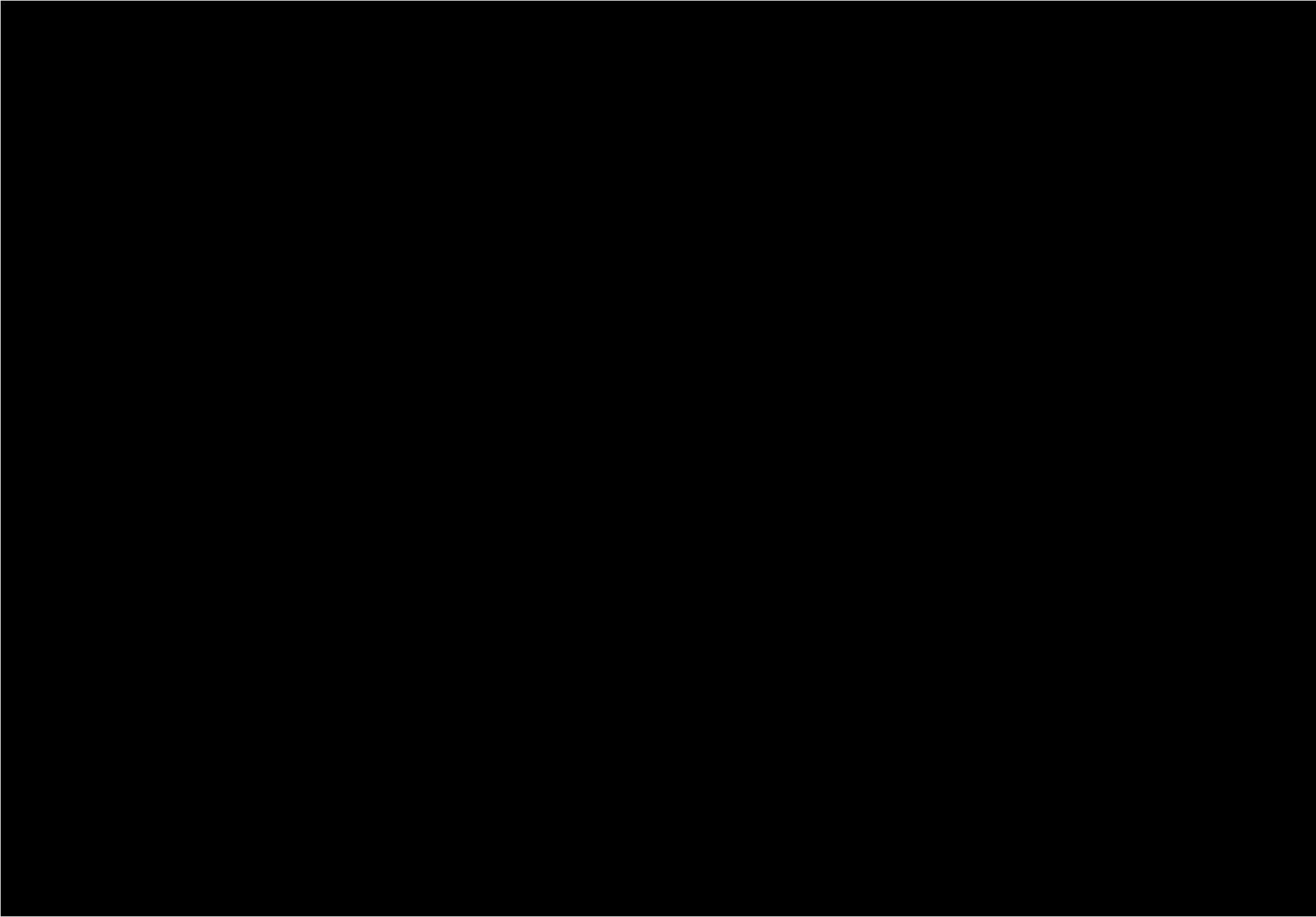
[REDACTED] customers expressed concerned about the safety of a GPS device inside a school

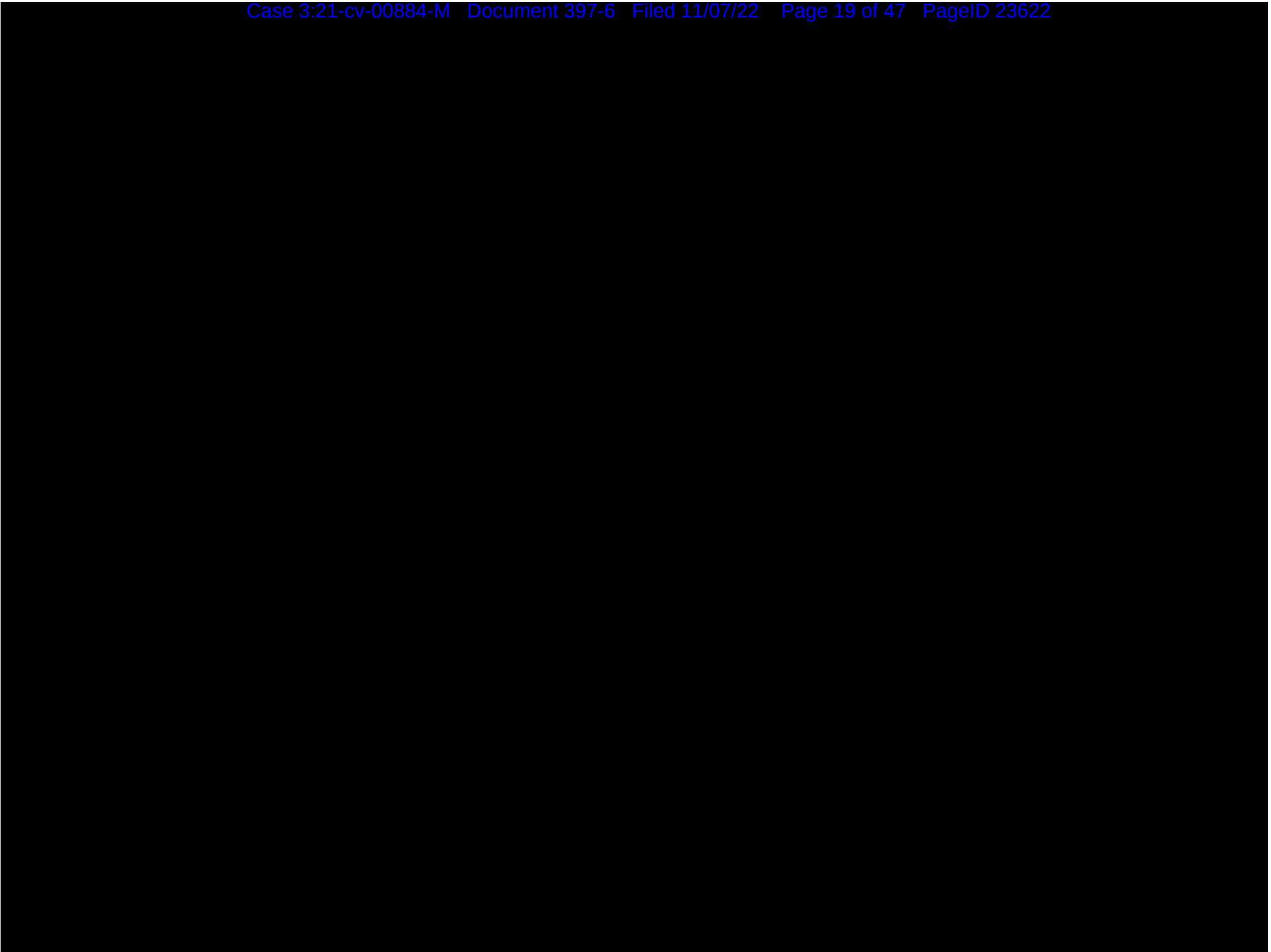
[REDACTED]

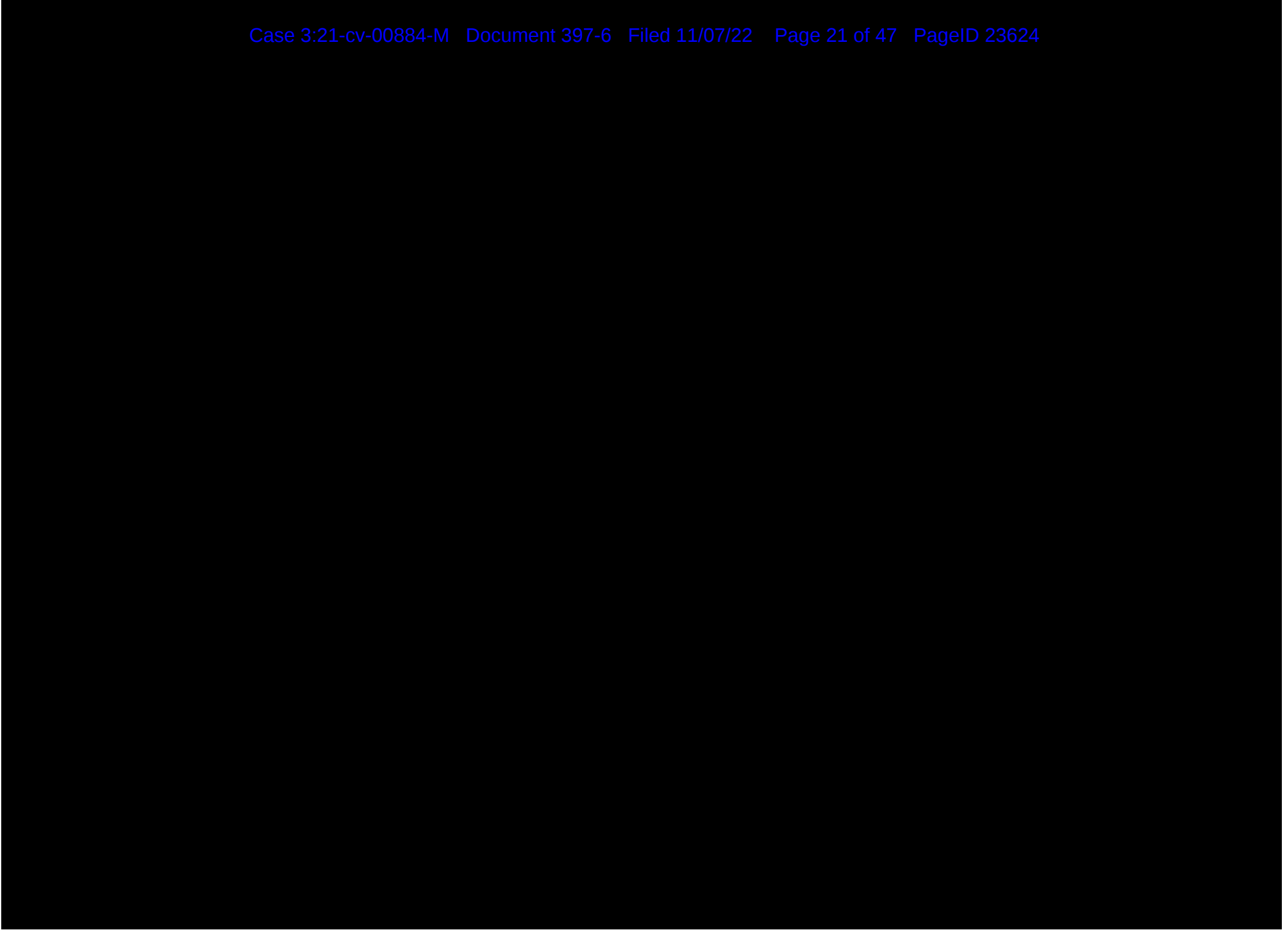
[REDACTED]

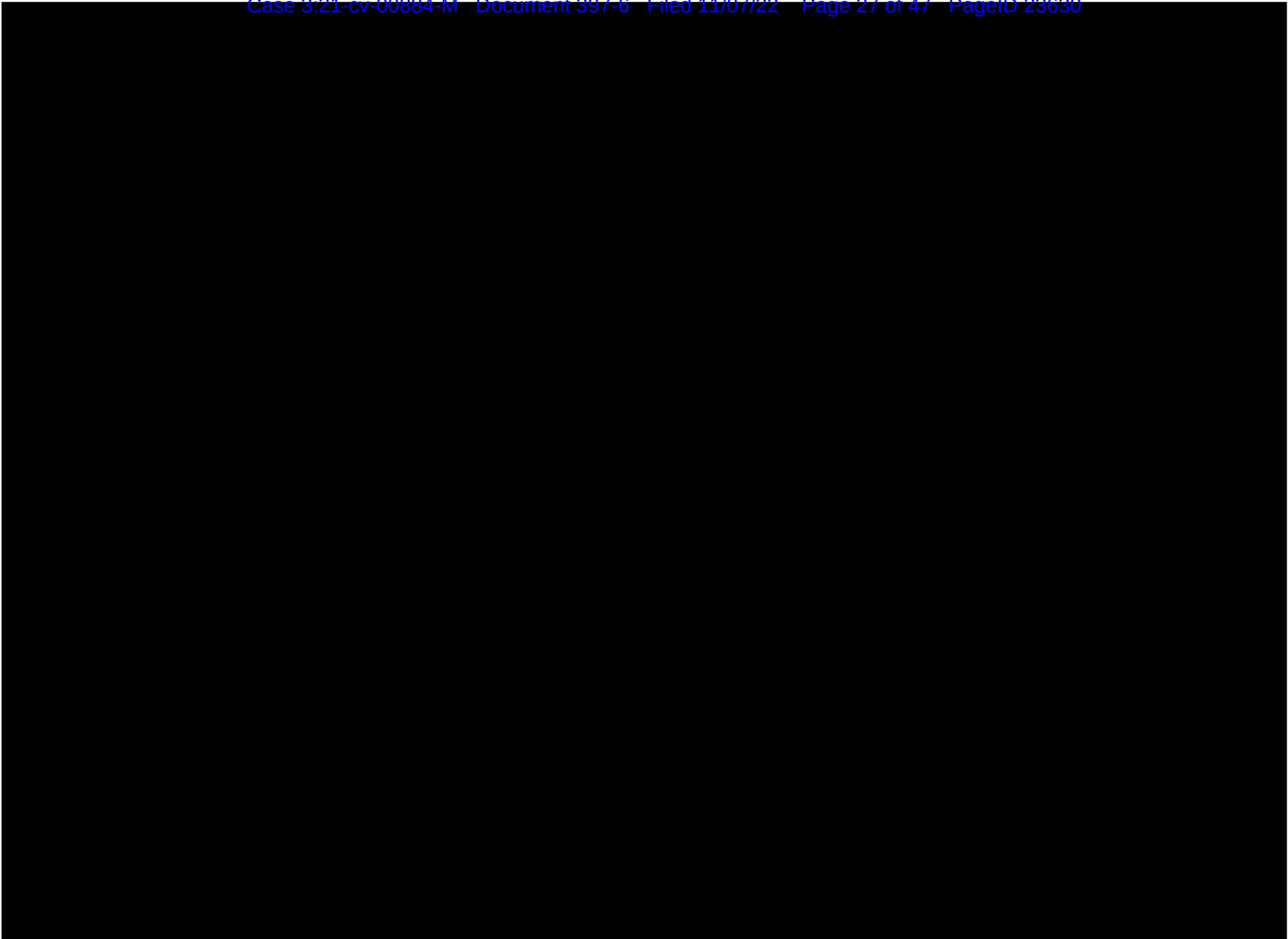
Reliance Chart
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GPS07 00102050
GPS06 00000250
GPS03 00003676-3688
GPS07 00015064-75
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GPS07 00102050
GPS15 00013679
GPS07 00029440-51
GPS07 00022929-47
GPS07 00015064-75
GPS05 00016796-98
GPS07 00081465-68
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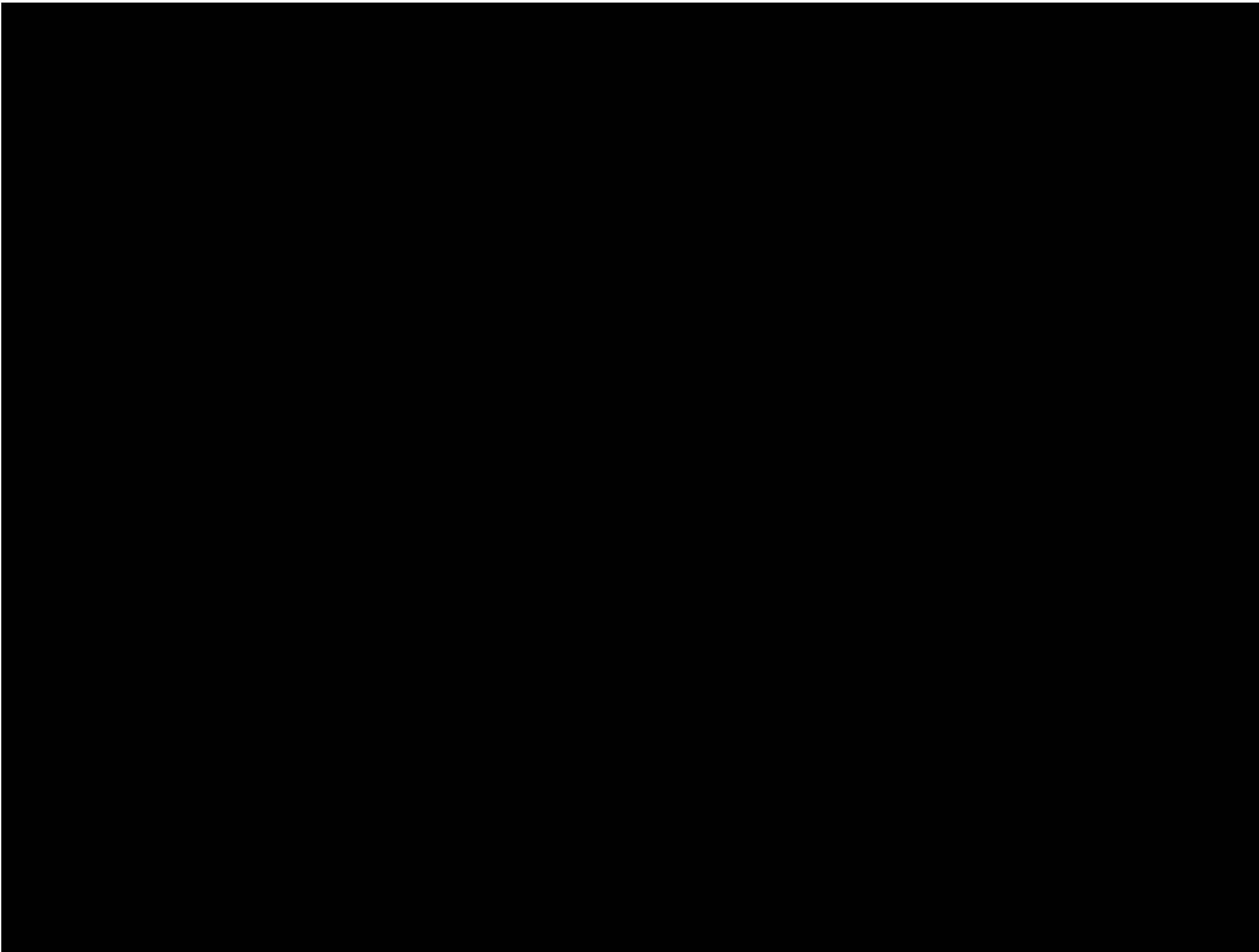
DEMONSTRATIVE EXHIBIT











18-May-21

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CHANGED TO



30-Jul-21

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